UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

123558

November 2, 2004

BY TELECOPY & REGULAR MAIL

Michael P. Last, Esq.
Counsellor at Law
One Financial Center
Boston, MA 02111-2659

Re: Cornell Dubilier Electronics Superfund Site
South Plainfield, Middlesex County, New Jersey

Dear Michael:

This will follow up on our recent conversation about the possible willingness of Dana Corporation ("Dana") and Cornell Dubilier Electronics, Inc. ("CDE") to perform the remedial investigation and feasability study ("RI/FS") for the third operable unit at the Cornell Dubilier Electronics, Inc. Superfund Site.

The United States Environmental Protection Agency ("EPA") appreciates your interest in pursuing this matter. EPA has prepared a draft statement of work for the groundwater investigation at the Site, a copy of which is enclosed. Please note that while the document requires some refinement and reorganization, the scope of work described therein is not expected to change. While EPA has entered into discussions with our contractor for performance of this work, we would be pleased to consider an offer by Dana and CDE to perform the RI/FS instead.

In the hope that it will help our discussions proceed smoothly, I would like to note that the statement of work lays out the minimum required elements of the RI/FS, which would not be subject to negotiation. I should also observe that if CDE and Dana do wish to undertake the work, it would have to be performed pursuant to an administrative order on consent.

At your request, Mark Nielsen will receive a copy of this letter and the enclosure.

I look forward to hearing from you when you have had an opportunity to review the enclosed document.

Very truly yours,

Sarah P. Flanagan

Sarah P. Flanagan
Assistant Regional Counsel

Enclosure

cc: Mark Nielsen, P.E. (w/enc.)
Robert Sanoff, Esq. "
Peter Mannino "
Deborah Mellott, Esq. "

DRAFT STATEMENT OF WORK FOR
GROUNDWATER REMEDIAL INVESTIGATION AND FEASIBILITY STUDY AT THE
CORNELL-DUBILIER ELECTRONICS SITE
SOUTH PLAINFIELD, NEW JERSEY

A. INTRODUCTION

1. The purpose of this remedial investigation/feasibility study (RI/FS) is to investigate the nature and extent of groundwater contamination at the Cornell-Dubilier Electronics Site ("the Site") and develop and evaluate potential remedial alternatives. The RI and FS are interactive and may be conducted concurrently so that the data collected in the RI influences the development of remedial alternatives in the FS, which in turn affects the data needs and the scope of treatability studies, if needed.

2. The Respondents will conduct this groundwater RI/FS and will produce a draft groundwater RI and FS report that are in accordance with this statement of work, the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (U.S. EPA, Office of Emergency and Remedial Response, October 1988), and any other guidance that EPA uses in conducting a RI/FS, as well as any additional requirements in the administrative order. The RI/FS Guidance describes the report format and the required report content. The Respondents will furnish all necessary personnel, materials, and services needed, or incidental to, performing the groundwater RI/FS, except as otherwise specified in the administrative order.

3. At the completion of the groundwater RI/FS, EPA will be responsible for the selection of a site remedy and will document this selection in a Record of Decision (ROD). The remedial action alternative selected by EPA will meet the cleanup standards specified in CERCLA Section 121. That is, the selected remedial action will be protective of human health and the environment, will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws, will be cost-effective, will utilize permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and will address the statutory preference for treatment as a principal element. The final groundwater RI/FS report, as adopted by EPA, and the baseline risk assessment will, with the administrative record, form the basis for the selection of the site's remedy and will

provide the information necessary to support the development of the ROD.

4. As specified in CERCLA Section 104(a)(1), as amended by SARA, EPA will provide oversight of the Respondent's activities throughout the groundwater RI/FS. The Respondents will support EPA's initiation and conduct of activities related to the implementation of oversight activities.

B. TASK I - SCOPING

1. The RI/FS is conducted to gather sufficient data and information necessary to characterize the nature and extent of contamination in order to support the selection of a groundwater remedy that will reduce or eliminate risks to human health or the environment associated with groundwater contamination at the site.

2. The RI/FS achieves its objectives by determining the horizontal and vertical distribution and concentration of hazardous substances and its association with the site.

3. Before planning RI/FS activities, all existing site data will be thoroughly compiled and reviewed by the Respondents. Specifically, this will include presently available data relating to the varieties and quantities of hazardous substances at the site, and past disposal practices. This information will be utilized in determining additional data needed to characterize the site, better define potential applicable or relevant and appropriate requirements (ARARs), and develop a range of preliminarily identified remedial alternatives. Data Quality Objectives (DQOs) will be established subject to EPA approval which specify the usefulness of existing data. Decisions on the necessary data and DQOs will be made by EPA.

4. The Respondents will conduct a site visit during the scoping phase of the project to assist in developing a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors at the site. During the site visit the Respondents should observe the site's physiography, hydrology, geology, and demographics, as well as natural resource, ecological and cultural features. This information will be utilized to better scope the project and to determine the extent of additional groundwater data necessary to characterize the site, better define potential ARARs, and narrow the range of preliminarily identified remedial alternatives.

5. Once the Respondents have collected and analyzed existing data and conducted a site visit, the specific project scope will be planned. Project planning activities include those tasks described below as well as identifying data needs, developing a work plan, designing a data collection program, and identifying health and safety protocols. The Respondents will meet with EPA regarding the following activities before the drafting of the groundwater RI/FS work plan, sampling and analysis plan, and site health and safety plan.

a. Groundwater RI/FS Work Plan and Schedule (2.3.1)

Within thirty (30) days of the effective date of this Order, Respondent shall submit to EPA an RI/FS Work Plan for the completion of the groundwater RI/FS. The RI/FS Work Plan should include, among other things, a detailed schedule for RI/FS activities at the Site. The schedule shall provide for the completion of the groundwater RI/FS within twelve (12) months of EPA's approval of the RI/FS Work Plan. If EPA disapproves, or requires revisions to, the RI/FS Work Plan in whole or in part, Respondent shall amend and submit to EPA a revised Work Plan which is responsive to the directions in all EPA comments, within twenty-one (21) days of receiving EPA's comments. The RI/FS Work Plan shall include:

A. Quality Assurance/Quality Control Project Plan (QAPP), which shall be prepared consistent with "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (EPA QA/R-5, October 1998), and which shall include the following elements:

B. A detailed description of the sampling, analysis, and monitoring that shall be performed during the RI/FS phase, consistent with this Order. At a minimum, the QAPP shall provide the following:

i. A plan for the delineation of contamination in the groundwater. The plan shall include, at a minimum:

a. The installation of additional shallow and deep bedrock monitoring wells to refine the known extent of groundwater contamination. This phase, identified as Phase II, shall include the installation of:

Five additional shallow bedrock monitoring wells to delineate the areal extent of groundwater contamination and further define flow and direction, in the following areas:

1. South of MW09, just west of the wetlands;
2. East of the Bound Brook, to be located on the Borough of South Plainfield Department of Public Works Property;
3. West of the industrial park, on the south side of Spicer Avenue;
4. Northwest of the industrial park, across Hamilton Boulevard from Building No. 5; and
5. North of the industrial park, across Hamilton Boulevard.

Four additional "deep" bedrock monitoring wells shall be installed to investigate the vertical extent of groundwater contamination, define the vertical component of groundwater flow, and identify deep bedrock flow. The four deep wells shall be co-located with shallow monitoring wells, and are recommended as follows:

6. Adjacent to MW11;
7. South of TP09, just north of the wetlands;
8. Northwest of the industrial park, across Hamilton Boulevard from Building No. 5; and
9. North of the industrial park, across Hamilton Boulevard.

b. Two complete rounds of sampling shall be performed on all of the groundwater monitoring wells. The sampling parameters will include TA VOCs, PCBs, TAL Metals, and Cyanide. Non-RAS analysis shall include PCB congeners, dioxins/furans and several monitored natural attenuation/water quality parameters. The Non-RAS analysis shall also be performed on a subset of groundwater samples.

Pending a review of the results of the sampling performed at the Phase II groundwater monitoring wells, installation of additional groundwater monitoring wells may be necessary to determine the extent of off-site migration of contamination.

c. An inventory of water supply wells (public or private) that lie within a one-mile radius of the Site, or that lie within or just outside (within 1/4 mile) of the "Interim Ground-Water Impact Area" defined by the NJDEP during their investigation of the Pitt Street private wells (NJDEP, 1991) shall be performed. This inventory shall be based upon a review of documents obtained from the NJDEP Bureau of Water Allocation, discussions with officials and file reviews at local health departments, and door-to-door surveys in locations nearest to the Site and/or in older neighborhoods more likely to have private wells. The locations of these wells shall subsequently be posted on all groundwater contaminant isoconcentration maps prepared for the Site to illustrate the relationship of existing groundwater use to any

Site-related groundwater contamination. The potential influence of water withdrawal from any of these wells on groundwater flow directions at the Site shall also be considered.

The results of this well search shall also be evaluated to determine if any wells could be sampled, in leu of the installation of some of the above-referenced wells.

d. Pumping Test/Treatability Study

At present, it is unknown whether a pumping test or treatability study shall be conducted. However, shall a pumping test or treatability study be determined as necessary, the Respondents shall submit a plan conforming to the following requirements.

Aquifer transmistivity and hydraulic conductivity in the shallow bedrock unit shall be determined to predict the rate of groundwater flow and contaminant migration, and identify possible preferred contaminant migration pathways. Therefore, a short-term constant-rate (approximately 24 to 72 hours) aquifer pumping test shall be performed using one of the current monitoring wells as the pumping well (possibly MW04). A step test shall be performed prior to the constant-rate test in order to identify the pumping rate. Depending on the well selected, piezometers may be needed to be installed for additional water level monitoring during the pump test. The need for aquifer testing in the deep bedrock unit shall be evaluated after groundwater samples from this unit are collected and analyzed. Packer testing may be considered as an alternative, or in addition to, the pumping test.

The recharge/discharge relationship between the local bedrock groundwater system and the Bound Brook shall be evaluated through comparison of water levels in the stream and adjacent wells, evaluation of possible boundary effects during the pumping test, and temporal monitoring. The conceptual model of the groundwater flow regime shall include measured water levels in the Bound Brook, and additional stream gauges shall be installed. The vertical relationship between surface and groundwater levels shall be evaluated to determine the recharge/discharge relationship along various stretches of the Bound Brook. Quantification of inflow to the groundwater system may be necessary to evaluate induced recharge effects likely to be observed during the aquifer pumping test.

Respondents shall evaluate the long-term relationship between the Bound Brook and the site groundwater, under natural conditions, temporal monitoring of fluctuations in groundwater levels and the

Bound Brook. Data loggers shall be installed in selected site monitoring wells and at a station in the Bound Brook, to automatically record water levels at pre-set intervals. A monitoring period of 30 days is recommended, preferably encompassing one or more significant rainfall events. The comparison of recorded water level trends shall be used to predict recharge and leakage effects between different water-bearing zones and the recharge/discharge relationship between the Bound Brook and the local groundwater system.

ii. A plan to characterize and evaluate the potential for vapor intrusion into indoor air at properties in the vicinity of the industrial park;

a. Conduct vapor intrusion sampling at approximately 15 properties west and north of the former CDE facility. The sampling program shall consist of direct push soil borings, soil gas sampling, and indoor/outdoor air sampling. The sampling is intended to assess whether VOCs present in the subsurface are a potential health risk through inhalation of indoor air. Specific properties to be sampled will be determined by EPA.

iii. All sampling, analysis, data assessment, and monitoring shall be performed in accordance with the "Region II CERCLA Quality Assurance Manual," Revision 1, EPA Region 2, dated October 1989, and any updates thereto, or an alternate EPA-approved test method, and the guidelines set forth in this Order. All testing methods and procedures shall be fully documented and referenced to established methods or standards.

iv. The QAPP shall also specifically include the following items:

a. An explanation of the way(s) the sampling, analysis, testing, and monitoring will produce data for the RI/FS phase;

b. A detailed description of the sampling, analysis, and testing to be performed, including sampling methods, analytical and testing methods, sampling locations and frequency of sampling;

c. A map depicting sampling locations; and

d. A schedule for performance of specific tasks.

v. In the event that additional sampling locations, testing, and analyses are utilized or required, Respondent(s) shall submit to EPA an addendum to the QAPP for approval by EPA.

vi. The QAPP shall address the following elements:

Project Management

a. Title and Approval Sheet
b. Table of Contents and Document Control Format
c. Distribution List
d. Project/Task Organization and Schedule
e. Problem Definition/Background
f. Project/Task Description
g. Quality Objectives and Criteria for Measurement Data
h. Special Training Requirements and Certification
i. Documentation and Records

Measurement/Data Acquisition

j. Sampling Process Design
k. Sampling Methods Requirements
l. Sample Handling and Custody Requirements
m. Analytical Methods Requirements
n. Quality Control Requirements
o. Instrument/Equipment Testing, Inspection, and Maintenance Requirements
p. Instrument Calibration and Frequency
q. Inspection/Acceptance Requirements for Supplies and Consumables
r. Data Acquisition Requirements (Non-Direct Measurements)
s. Data Management

Assessment/Oversight

t. Assessments and Response Actions
u. Reports to Management

Data Validation and Usability

v. Data Review, Validation, and Verification Requirements
w. Validation and Verification Methods
x. Reconciliation with Data Quality Objectives

vii. In order to provide quality assurance and maintain quality control with respect to all samples to be collected, Respondent(s) shall ensure the following:

a. Quality assurance and chain-of-custody procedures shall be performed in accordance with standard EPA protocol and guidance, including the "Region II CERCLA Quality Assurance Manual," Revision 1, EPA Region 2, dated October 1989, and any updates thereto, and the guidelines set forth in this Order.

b. The laboratory to be used must be specified. If the laboratory participates in the Contract Laboratory Program (CLP) for the analysis to be performed for this investigation, then project specific Performance Evaluation (PE) samples will not be required, as CLP laboratories run EPA PEs on a quarterly basis. If the proposed laboratory does not participate in the CLP for the analyses required, PE samples must be analyzed to demonstrate the capability to conduct the required analysis prior to being approved for use. Once a non-CLP laboratory has been selected, the laboratory should submit a copy of their Laboratory Quality Assurance Program Plan (LQAPP) to EPA for review and approval.

For any analytical work performed, including that done in a fixed laboratory, in a mobile laboratory, or in on-site screening analyses, Respondent must submit to EPA a "Non-CLP Superfund Analytical Services Tracking System" form for each laboratory utilized during a sampling event, within thirty (30) days after acceptance of the analytical results. Upon completion, such documents shall be submitted to the EPA Project Coordinator, with a copy of the form and transmittal letter to:

Regional Sample Control Center Coordinator
U.S. EPA Region 2
Division of Environmental Science &
Assessment
2890 Woodbridge Avenue, Bldg. 209, MS-215
Edison, NJ 08837

c. The laboratory utilized for analyses of samples must perform all analyses according to accepted EPA methods as documented in the "Contract Lab Program Statement of Work for Organic Analysis, (OLM04.2)" or the latest revision, and the "Contract Lab Program Statement of Work for Inorganic Analysis, (ILM04.0)" or the latest revision, or other EPA approved methods.

d. Unless indicated otherwise in the approved QAPP, upon receipt from the laboratory, all data shall be validated.

e. Submission of the validation package (checklist, report and Form Is containing the final data) to EPA, prepared in accordance with the provisions of Subparagraph g., below.

f. Assurance that all analytical data that are validated as required by the QAPP are validated according to the procedures stated in the "EPA Region II Contract Lab Program Organics Data Review and Preliminary Review (SOP #HW-6, Revision 11)," dated June 1996, or the latest revision, and the "Evaluation of Metals Data for the Contract Laboratory Program (SOP #HW-2, Revision 11)," dated January 1992 or the latest revision, or EPA-approved equivalent procedures. Region 2 Standard Operating Procedures are available at: *http://www.epa.gov/region02/smb/sops.htm*

g. Unless indicated otherwise in the QAPP, Respondent shall require deliverables equivalent to CLP data packages from the laboratory for analytical data. Upon the EPA's request, Respondent shall submit to the EPA the full documentation (including raw data) for this analytical data. EPA reserves

the right to perform an independent data validation, data validation check, or qualification check on generated data.

h. Respondent shall insert a provision in its contract(s) with the laboratory utilized for analyses of samples, which will require granting access to EPA personnel and authorized representatives of the EPA for the purpose of ensuring the accuracy of laboratory results related to the Site.

C. A Health and Safety Plan (HSP), which shall conform to 29 CFR §1910.120, "OSHA Hazardous Waste Operations Standards," and the EPA guidance document, "Standard Operating Safety Guidelines" (OSWER, 1988).

viii. Following approval or modification by EPA, the Work Plan shall be deemed to be incorporated into this Order by reference.

C. TASK II - COMMUNITY RELATIONS

EPA has developed a Site-specific community relations plan and will make revisions to this plan as necessary and in accordance with EPA guidance and the NCP. To the extent requested by EPA, Respondents shall provide information supporting EPA's community relations programs.

D. TASK III - SITE CHARACTERIZATION (RI/FS Guidance, Chapter 3)

1. As part of the groundwater RI, the Respondents will perform the activities described in this task, including the preparation of a site characterization summary and RI report. The overall objective of site characterization is to describe areas of a site that may pose a threat to human health or the environment. This is accomplished by first determining a site's physiography, geology, and hydrology. Surface and subsurface pathways of migration will be defined. The Respondents will identify the sources of contamination and define the nature, extent, and volume of the sources of contamination, including their physical and chemical constitutes as well as their concentrations at incremental locations to background in the affected media. The Respondents will also investigate the extent of migration of this contamination, as well as its volume and any changes in its physical or chemical characteristics, to provide for a comprehensive understanding of the nature and extent of

groundwater contamination at the site. Using this information, contaminant fate and transport is then determined and projected.

2. During this phase of the groundwater RI/FS, the work plan, FSAP, QAPP, and health and safety plan are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the study. The Respondents will notify EPA at least two weeks in advance of the field work regarding the planned dates for field activities, including ecological field surveys, field lay out of the sampling grid, excavation, installation of wells, initiating sampling, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities. The Respondents will demonstrate that the laboratory and type of laboratory analyses that will be utilized during site characterization meets the specific QA/QC requirements and the DQOS of the site investigation as specified in the QAPP. In view of the unknown site conditions, activities are often iterative, and to satisfy the objectives of the RI/FS it may be necessary for the Respondents to modify the work specified in the initial work plan. In addition to the deliverables below, the Respondents will provide a monthly progress report and participate in meetings at major points in the RI/FS.

a. Field Investigation (3.2)

The field investigation includes the gathering of data to define site physical and biological characteristics, sources of contamination, and the nature and extent of contamination at the site. These activities will be performed by the Respondents in accordance with the RI/FS work plan and QAPP. At a minimum, this shall address the following:

i. Implement and document field support activities (3.2.1)

The Respondents will initiate field support activities following approval of the groundwater RI/FS work plan and QAPP. Field support activities may include scheduling, and procuring equipment, office space, laboratory services, and/or contractors. The Respondents may initiate other time critical field support activities, such as obtaining access to the site, prior to approval of the RI/FS work plan and QAPP. The Respondents will provide EPA with reasonable notice prior to initiating field support activities so that EPA may adequately schedule oversight tasks. The Respondents will also notify EPA in writing upon completion of field support activities.

ii. Investigate and define site physical and biological characteristics (3.2.2)

The Respondents will collect data on the physical and biological characteristics of the site and its surrounding areas including the physical physiography, geology, and hydrology, and specific physical characteristics identified in the work plan. This information will be ascertained through a combination of physical measurements, observations, and sampling efforts and will be utilized to define potential transport pathways and human and ecological receptor populations. In defining the site's physical characteristics the Respondents will also obtain sufficient engineering data (such as pumping characteristics) for the projection of contaminant fate and transport, and development and screening of remedial action alternatives, including information to assess treatment technologies.

iii. Define sources of contamination (3.2.3)

The Respondents will locate each source of contamination. For each location, the areal extent and depth of contamination will be determined by sampling at incremental depths on a sampling grid. The physical characteristics and chemical constituents and their concentrations will be determined for all known and discovered sources of contamination. The Respondents shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QA/QC plan and DQOs.

Defining the source of contamination will include analyzing the potential for contaminant release (e.g., long term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating remedial actions, including information to assess treatment technologies.

iv. Describe the nature and extent of contamination (3.2.4)

The Respondents will gather information to describe the nature and extent of contamination as a final step during the field investigation. To describe the nature and extent of contamination, the Respondents will utilize the information on site physical and biological characteristics and sources of contamination to give a preliminary estimate of the contaminants that may have migrated. The Respondents will then implement an iterative monitoring program and any study program identified in the groundwater RI/FS work plan (which includes the QAPP) such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of

contaminants through the various media at site can be determined. In addition, the Respondents will gather data for calculations of contaminant fate and transport. This process is continued until the area and depth of contamination are known to the level of contamination established in the QA/QC plan and DQOs. EPA will use the information on the nature and extent of contamination to determine the level of risk presented by the site. Respondents will use this information to help to determine aspects of the appropriate remedial action alternatives to be evaluated.

b. Data Analysis (3.4)

Evaluate site characteristics (3.4.1)

The Respondents will analyze and evaluate the data to describe: (1) site physical and biological characteristics, (2) contaminant source characteristics, (3) nature and extent of contamination and (4) contaminant fate and transport. Results of the site physical characteristics, source characteristics, and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The evaluation will include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to EPA in a technical memorandum prior to their use. All data and programming, including any proprietary programs, shall be made available to EPA together with a sensitivity analysis. The groundwater RI data shall be presented in a format (i.e., WordPerfect version 9.0 or latest on computer disk(s)). The Respondents shall agree to discuss and then collect any data gaps identified by the EPA that is needed to complete the baseline risk assessment. (See "Guidance for Data Useability in Risk Assessment - OSWER Directive # 9285.7- 05 - October 1990.) Also, this evaluation shall include any information relevant to site characteristics necessary for evaluation of the need for remedial action in the baseline risk assessment and for the development and evaluation of remedial alternatives. (See Risk Evaluation of Remedial Alternatives (Part C) - OSWER Directive 9285.7-01C - December 1991.) Analysis of data collected for site characterization will meet the DQOS developed in the QA/QC plan (or revised during the RI).

c. Data Management Procedures (3.5)

The Respondents will consistently document the quality and validity of field and laboratory data compiled during the groundwater RI.

i. Document field activities (3.5.1)

Information gathered during site characterization will be consistently documented and adequately recorded by the Respondents in well maintained field logs and laboratory reports. The method(s) of documentation must be specified in the work plan and/or the QAPP. Field logs must be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports must document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

ii. Maintain sample management and tracking (3.5.2; 3.5.3.)

The Respondents will maintain field reports, sample shipment records analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the evaluation of remedial alternatives. Analytical results developed under the work plan will not be included in any site characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report. In addition, the Respondents will establish a data security system to safeguard chain-of custody forms and other project records to prevent loss, damage, or alteration of project documentation.

d. Site Characterization Deliverables (3.6)

The Respondents will prepare the preliminary site characterization summary and the remedial investigation report.

Preliminary Site Characterization Summary(3.6.2)

After completing field sampling and analysis, the Respondents will prepare a concise characterization summary. This summary will review the investigative activities that have taken place, and describe and display site data documenting the location and characteristics of surface and subsurface feature and contamination at the site including the affected medium, types, location types, physical state, concentration of contaminants and quantity. In addition, the location, dimensions, physical condition and varying concentrations of each contaminant throughout each source and the extent of contaminant migration through each of the affected media will be documented. The site characterization summary will provide EPA with a preliminary reference for developing the risk assessment, and evaluating the development and screening of remedial alternatives and the refinement and identification of ARARs.

E. TASK IV - IDENTIFICATION OF CANDIDATE TECHNOLOGIES (4.2)

The Respondents will identify in a technical memorandum, subject to EPA's review and approval, candidate technologies for a treatability studies program. The memorandum will be submitted after the last set of analytical results collected during the RI have been validated. The listing of candidate technologies will cover the range of technologies required for alternatives analysis (Task 8.2). The specific data requirements for the testing program will be determined and refined during site characterization and the development and screening of remedial alternatives (Tasks 3 and 8, respectively).

F. TASK V - TREATABILITY STUDIES; AS NECESSARY

Treatability testing will be performed by the Respondents, at EPA's request, to assist in the detailed analysis of alternatives. In addition, if applicable, testing results and results and operating conditions will be used in the detailed design of the selected remedial technology. The following activities will be performed by the Respondents.

i. Conduct literature survey and determine the need for treatability testing (4.2.2)

The Respondents will conduct a literature survey to gather information on performance, relative costs, applicability, removal efficiencies, operation and maintenance (O&M) requirements, and implementability of candidate technologies. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated, or cannot be adequately evaluated for this site on the basis of available information, treatability testing will be conducted. Where it is determined by EPA that treatability testing is required, and unless the Respondents can demonstrate to EPA's satisfaction that they are not needed, the Respondents will submit a statement of work to EPA outlining the steps and data necessary to evaluate and initiate the treatability testing program.

ii. Evaluate treatability studies (4.2.3)

Once a decision has been made to perform treatability studies, the Respondents and EPA will decide on the type of treatability testing to use (e.g., bench versus pilot). Because of the time required to design, fabricate, and install pilot scale equipment as well as perform testing for various operating

conditions, the decision to perform pilot testing should be made as early in the process as possible or minimize potential delays of the groundwater FS. To assure that a treatability testing program is completed on time, and with accurate results, the Respondents will either submit a separate treatability testing work plan or an amendment to the original site work plan EPA review and approval.

iii. Treatability Testing and Deliverables (4.3)

The deliverables that are required, in addition to the memorandum identifying candidate technologies, where treatability testing is conducted include a work plan, a sampling and analysis plan, and a final treatability evaluation report. EPA may also require a treatability study and safety plan, where appropriate.

iv. Treatability testing work plan (4.3.2)

The Respondents will prepare a treatability testing work plan or amendment to the original site work plan for EPA review and approval describing the site background, remedial technology(ies) to be tested, test objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. The DQOs for treatability testing should be documented as well. If pilot-scale treatability testing is to be performed, the pilot-scale work plan will describe pilot plant installation and start-up, pilot plant operation and maintenance procedures, operating conditions to be tested, a sampling plan to determine pilot plant performance, and a detailed health and safety plan. If testing is to be performed off-site, the Respondents will address all necessary permitting requirements to the satisfaction of appropriate authorities.

v. Treatability study QAPP(4.3.3)

Within thirty (30) days of the identification by EPA of the need for a separate or revised QAPP, and HSP, Respondents shall submit to EPA a revised QAPP and HSP as appropriate. If EPA disapproves of or requires revisions to the revised QAPP and HSP, in whole or in part, Respondents shall amend and submit to EPA a revised treatability study QAPP and HSP, which is responsive to the directions in all EPA comments, within twenty-one (21) days of receiving EPA's comments.

If the original QAPP is not adequate for defining the activities to be performed during the treatability test, a

separate treatability study QAPP or amendment to the original QAPP for the Site will be prepared by the Respondents for EPA review and approval. Task 1 of this Statement of Work provides additional information on the requirements of the QAPP.

vi. Treatability study health and safety plan (4.3.4)

If the original health and safety plan is not adequate for defining the defining the activities to be performed during the treatment tests, a separate or amended health and safety plan will be developed by the Respondents. Task 1 of this statement of work provides additional information on the requirements of the health and safety plan. EPA does not "approve" the treatability study health and safety plan.

vii. Treatability study evaluation report (4.3.5)

Following completion of treatability testing, the Respondents will analyze and interpret the testing results in a technical report to EPA. Depending on the sequences of activities, this report may be a part of the groundwater RI/FS report or a separate deliverable. The report will evaluate each technology's effectiveness, implementability, cost and actual results as compared with predicted results as compared with predicted results. The report will also evaluate full scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

G. TASK VI - BASELINE RISK ASSESSMENT

Respondent will prepare a Baseline Human Health Risk Assessment (BHHRA) for the Site which shall be incorporated by the Respondent into the RI. Respondent shall provide EPA with the following deliverables:

1. Baseline Human Health Risk Assessment.

   A. Actual and potential cancer risks and non-cancer hazards to human health shall be identified and characterized in accordance with CERCLA, the NCP, and EPA guidances including, but not limited to, the RI/FS Guidance, "Land Use in the CERCLA Remedy Selection Process" (OSWER Directive No. 9355.7-04) and the definitions and provisions of "Risk Assessment Guidance for Superfund ("RAGS"), " Volume 1, "Human Health Evaluation Manual," (December 1989) (EPA/540/1-89/002).

B. Representative groundwater contaminants and associated concentrations in for the BHHRA shall be determined utilizing all currently available media-specific analytical data generated during the RI/FS.

C. Memorandum on Exposure Scenarios and Assumptions. Within 45 days after approval of the groundwater RI/FS work plan, Respondent shall submit a memorandum describing the exposure scenarios and assumptions, taking into account for the BHHRA the present and reasonably anticipated future land use of the Site. The memorandum should include appropriate text describing the conceptual site model and exposure routes of concern for the site, and include a completed RAGS Part D Table 1. This table shall describe the pathways that will evaluated in the BHHRA, the rationale for their selection, and a description of those pathways that will not be evaluated. In addition, the Memorandum shall include a completed RAGS Part D Table 4 describing the exposure pathway parameters with appropriate references to EPA's 1991 Standard Default Assumptions and updated guidance developed by EPA. If EPA disapproves of or requires revisions to the memorandum, in whole or in part, which disapproval or required revisions shall be provided in writing with reasons for the disapproval or directions for revisions to make the submittal approvable, Respondent shall amend and submit to EPA a revised memorandum which is responsive to the directions in all EPA comments, within 14 days of receiving EPA's comments.

D. Pathway Analysis Report (PAR). The Respondent shall prepare and submit a PAR within forty-five (45) days after receipt of the last set of validated data. The PAR shall be developed in accordance with OSWER Directive 9285.7-01D-1 dated December 17, 1997 (or more recent version), entitled, "*Risk Assessment Guidelines for Superfund Part D*" and other appropriate guidance in Appendix 1A and updated thereto. The PAR shall contain all the information necessary for a reviewer to understand how the risks at the site will be assessed. The PAR will build on the

Memorandum on Exposure Scenarios and Assumptions (see C above) describing the risk assessment process and how the risk assessment will be prepared. The PAR shall include completed RAGS Part D Tables 2, 3, 5, and 6 as described below. The PAR must be reviewed and approved by EPA prior to the submission of the draft BHHRA.

i. Chemicals of Concern (COC). The PAR shall contain all the information necessary for a reviewer to understand how the risks at the site will be evaluated.

a. Based on the results of the Site Characterization Summary Report the Respondent shall list the hazardous substances present in the groundwater and the contaminants of potential concern ("COPCs") as described in the Risk Assessment Guidance for Superfund Part A.

b. Table 2-Selection of COCs. Representative contaminants and associated concentrations in sample media for the PAR shall be determined utilizing all currently available media-specific validated analytical data generated during the groundwater RI/FS. The selection of COCs shall follow Risk Assessment Guidance for Superfund (Part A) and before chemicals are deleted as COCs they shall be evaluated against the residential PRGs from Region IX. The COCs shall be presented in completed RAGS Part D Table 2 format.

ii. Table 3 - Media Specific Exposure Point Concentrations. Using the chemicals selected in Table 2, this Table shall summarize the Exposure Point Concentrations for all COCs for the various media. The calculation of the Exposure Point Concentration shall follow the 1992 Guidance Document on the calculation of the 95% Upper Confidence Limit (UCL) on the Mean. In those cases where the 95% UCL exceeds the mean the maximum concentration shall be used as the EPC.

iii. Tables 5 and 6 - Toxicological Information. This section of the PAR shall provide the

toxicological data (e.g., Cancer Slope Factors, Reference Doses, Reference Concentrations, Weight of Evidence for Carcinogens, and adjusted dermal toxicological factors where appropriate) for the chemicals of concern. The toxicological data shall be presented in completed RAGS Part D Tables 5 and 6. The source of data in order of priority are: EPA's Integrated Risk Information System (IRIS), Health Effects Assessment Summary Tables (HEAST)-1997 and contact with EPA's National Center for Environmental Assessment. To facilitate a timely completion of the PAR, the Respondent shall submit a list of chemicals for which IRIS values are not available to EPA as soon as identified thus allowing EPA to facilitate obtaining this information from EPA's National Center for Environmental Assessment.

If EPA disapproves, or requires revisions to, the PAR, in whole or in part, Respondent shall amend and submit to EPA a revised PAR which is responsive to the directions in all of EPA's written comments within twenty-one (21) days of receipt of EPA's comments.

E. Baseline Human Health Risk Assessment of the RI Report. Within forty-five (45) days of EPA's approval of the PAR, the Respondent shall submit to EPA a Draft BHHRA for inclusion in the RI. The submittal shall include completed RAGS Part D Tables 7 through 10 summarizing the calculated cancer risks and non-cancer hazards and appropriate text in the risk characterization with a discussion of uncertainties and critical assumptions (e.g., background concentrations and conditions). The Respondent shall perform the BHHRA in accordance with the approach and parameters described in the approved Memorandum of Exposure Scenarios and Assumptions and the PAR describe above. Text and tables from these previously approved reports shall be included in the appropriate sections of the BHHRA.

If EPA disapproves or requires revisions to the section, in whole or in part, which disapproval or required revision shall be provided in writing with reasons for the disapproval or directions for revisions to make the submittal approvable, Respondent shall amend and submit to EPA a revised

report which is responsive to the directions in all EPA comments, within 30 days of receiving EPA's comments. The approved BHHRA shall be incorporated into the RI report.

H. TASK VII - REMEDIAL INVESTIGATION REPORT

1. Draft Groundwater Remedial Investigation Report

In accordance with the schedule in the approved groundwater RI/FS work plan, the Respondent shall submit a draft groundwater RI report that is consistent with the "Region II RI Report Guidelines."

2. Final Groundwater Remedial Investigation Report

Within 30 days of receiving EPA's comments on the Draft groundwater RI Report, the Respondent shall amend and submit to EPA a final report which is responsive to the directions in all EPA comments.

I. TASK VIII -DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES

The development and screening of remedial alternatives is performed to develop an appropriate range of waste management options that will be evaluated. This range of alternatives should include options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. The following activities will be performed as a function of the development and screening of remedial alternatives.

1. Development and Screening of Remedial Alternatives(5.2)

The Respondents will begin to develop and evaluate a range of appropriate waste management options that a minimum ensure protection of human health and the environment, concurrent with the RI site characterization task.

i. Develop general response action(5.2.2)

The Respondents will develop general actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the remedial action objectives.

ii. Identify areas or volumes of media(5.2.3)

The Respondents will identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the remedial action objectives. The chemical and physical characterization of the site will also be taken into account.

iii. Assemble and document alternatives(5.2.6)

The Respondents will assemble selected representative technologies into alternatives for each affected medium or operable unit.

Together, all of the alternatives will represent a range of treatment and containment combinations that will address either the site or the operable unit as a whole. A summary of the assembled alternatives and their related action-specific ARARS will be prepared by the Respondents for inclusion in a technical memorandum.

The reasons for eliminating alternatives during the preliminary screening process must be specified.

iv. Refine alternatives (5.2.7)

The Respondents will refine the remedial alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives. PRGs for each chemical in each medium will also be modified as necessary to incorporate any new risk assessment information presented in the baseline risk assessment report. Additionally, action-specific ARARs will be updated as the remedial alternatives are refined.

v. Conduct and document screening evaluation of each alternative(5.2.8)

The Respondents may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives will be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis. As appropriate, the screening will preserve the range of treatment and

containment alternatives that was initially developed. The range of remaining alternatives will include options that use treatment technologies and permanent solutions to the maximum extent practicable. The Respondents will make a presentation to EPA and the State, identifying the remedial action objectives and summarizing the development and preliminary screening of remedial alternatives.

2. Alternatives Development and Screening Deliverables(5.3)

The Respondents will prepare a technical memorandum summarizing the work performed in and the results of each task above, including an alternatives array summary. The memorandum will also summarize the reasoning employed in screening, arraying alternatives that remain after screening, and identifying the action-specific ARARs for the alternatives that remain after screening. These will be modified by the Respondents if required by EPA's comments to assure identification of a complete and appropriate range of viable alternatives to be considered in the detailed analysis. This deliverable will document the methods, rationale, and results of the alternatives screening process.

3. Detailed analysis of remedial alternatives

The detailed analysis will be conducted by the Respondents to provide EPA with the information needed to allow for the selection of a site remedy. This analysis is the final task to be performed by Respondents during the groundwater FS.

i. Detailed Analysis of Alternatives (6.2)

The Respondents will conduct a detailed analysis of alternatives which will consist of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

ii. Apply nine criteria and document analysis (6.2.1-6.2.4)

The Respondents will apply nine evaluation criteria to the assembled remedial alternatives to ensure that the selected remedial alternative will be protective of human health and the environment; will be in compliance with, or include a waiver of, ARARS; will be cost-effective; will utilized permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable; and will address the statutory preference for treatment as a principal element. The evaluation criteria include: (1) overall protection of human

health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state (or support agency) acceptance; and (9) community acceptance.

(Note: criteria 8 and 9 are considered after the RI/FS report has been released to the general public.) For each alternative the respondents should provide: (1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated which each alternative, and (2) a discussion of the individual criterion assessment. If the Respondents does not have direct input on criteria ,8) state (or support agency) acceptance and (9) community acceptance, these will be addressed by EPA.

iii. Compare alternatives against each other and document the comparison of alternatives (6.2.5; 6.2.6)

The Respondents will perform a comparative analysis between the remedial alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. Identification and selection of the preferred alternative are reserved by EPA. The Respondents will prepare a technical memorandum summarizing the results of the comparative analysis.

iv. Detailed Analysis Deliverables(6.3)

In addition to the technical memorandum summarizing the results of the comparative analysis, the respondents will submit a draft groundwater FS report to EPA for review and approval. Once EPA's comments have been addressed by the Respondents to EPA's satisfaction, the final groundwater FS report may be bound with the final groundwater RI report.

J. TASK IX - FEASIBILITY STUDY REPORT (6.4)

The Respondent shall prepare a groundwater Feasibility Study (FS) Report consisting of a detailed analysis of alternatives and a cost-effectiveness analysis, in accordance with the National Contingency Plan (NCP), 40 CFR Part 300, as well as the most recent guidance. Within thirty (30) days of the Task VIII presentation to EPA, Respondent shall submit to EPA a Draft groundwater FS report which reflects the findings in the approved Baseline Risk Assessment. Respondent shall refer to the groundwater RI/FS Work Plan and the RI/FS Guidance and the SOW for report content and format. Within fourteen (14) days of submitting the draft FS report, Respondents shall make a

presentation to EPA and the State at which Respondents shall summarize the findings of the draft groundwater FS report and discuss EPA's and the State's preliminary comments and concerns associated with the draft groundwater FS report. If EPA disapproves of or requires revisions to the draft groundwater FS report, in whole or in part, Respondent shall amend and submit to EPA a revised draft FS report which is responsive to the directions in EPA's comments, within twenty-one (21) days of receiving EPA's written comments.

The Respondent will prepare a draft groundwater FS report for EPA review and comment. The groundwater FS report shall contain the following:

- Summarize Feasibility Study objectives
- Summarize remedial objectives
- Articulate general response actions
- Identification and screening of remedial technologies
- Remedial alternatives description
- Detailed analysis of remedial alternatives
- Summary and conclusions

The Respondent's technical feasibility considerations shall include the careful study of any problems that may prevent a remedial alternative from mitigating site problems. Therefore, the site characteristics from the RI must be kept in mind as the technical feasibility of the alternative is studied. Specific items to be addressed are reliability (operation over time), safety, operation and maintenance, ease with which the alternative can be implemented, and time needed for implementation.

"CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (draft), OSWER Directive No. 9234.1-01 and -02.

"Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S." U.S. EPA, Office of Emergency and Remedial Response, (draft), OSWER Directive No. 9283.1-2.

"Draft Guidance on Superfund Decision Documents," U.S. EPA, Office of Emergency and Remedial Response, March 1988, OSWER Directive No. 9355.-02

"Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual" (Part A), EPA/540'1-89/002

"Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual" (Part B), EPA/540/R-92/003

"Risk Assessment Guidance for Superfund - Volume II Environmental Evaluation Manual," March 1989, EPA/540/1-89/ 001

"Guidance for Data Useability in Risk Assessment," October, 1990, EPA/540/G-90/008

"Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)," August 28, 1990, OSWER Directive No.9835.15.

"Risk Evaluation of Remedial Alternatives" (Part C), December 1991, OSWER Directive 9285.7-01C.

"Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, OSWER Directive No. 9355.0-30.

"Supplemental Guidance to RAGS: Calculating the Concentration Term," May 1992, OSWER Directive 9285.7-081.

"Health and Safety Requirements of Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order No. 1440.2.

OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

"Interim Guidance on Administrative Records for Selection of CERCLA Response Actions," U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

"Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0#3B.

"Community Relations During Enforcement Activities And Development of the Administrative Record," U.S. EPA, Office of Programs Enforcement, November 1988, OSWER Directive No. 9836.0-1a.